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MONTHLY REVIEW

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American Electro-Platers Society

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I shall pass through this world but once. Any good thing, therefore, that I can do, or any kindness that I can show to any human being, let me do it now. Let me neither defer nor neglect it, for I shall not pass this way again.—Amiel.

MONTHLY REVIEW

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American Electro-Platers' Society

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Vol. 8 JANUARY No. 1

BRIDGEPORT NUMBER

Accuracy

The wide limits that are permissible in the operation of electro-plating solutions often lead to the making of inaccurate statements. An acceptable deposit of metal is often taken as a good deposit and the composition of a plating bath, in which such a deposit was produced, as a perfectly good working solution. Such conclusions are confusing and lead to a multiplicity of formulae, which, in turn, decreases the respect of the knowledge possessed by the average electro-plater. If the columns of any electro-plating journal are followed, especially the query column, it will be found that many times solutions of different proportions and even of different chemicals are recommended in answer to appeals for assistance to produce something that requires identical results.

It is not to be presumed that with one combination of chemicals a solution can be made that will give uniform results on all classes of work, but there certainly is some one solution in which work of a like nature can be plated, and the quality of the work and the production be consistent. The reason that such a solution is not known is because there has not been sufficient accuracy in recording details of the making and operation of plating solutions.

Were uniform records made and every phase of electro-plating analyzed, we could have in one decade data upon which a real science could be established. New statements should be verified. Mere statements don't prove anything. Results without taking into consideration and tabulating all data which can be verified are of little value. Consistent results require the united effort of many investigators.

There are wonderful latent possibilities in the electro-plating field. What do we really know about electro-plating except that in our crude way we can produce acceptable results? There are wonderful latent possibilities in the members of this Society. Every man is an investigator and could accomplish results that are now only dreams, if he would only think, record results, check up his work and pass along to his fellow-worker reliable, accurate data.

Apply the knowledge you already have gained through careful observations of practical results, and you are considered a genius. It can be done, and Emerson knew when he wrote: "The Power that resides in him is new in nature, and none but he knows what that is which he can do, nor does he know until he has tried."

George B. Hogaboom.

CLEANING AND COPPER-PLATING IN THE SAME SOLUTION

William McKeon

This paper has been written merely to bring to your attention the possibilities which such a solution offers on iron and steel products where increased production, reduction in the number of operations and labor costs are the greatest factors.

Shells of varying shapes and sizes of cold rolled steel are being cleaned and plated in this solution daily with most satisfactory results, both in the quality of the finish and the quantities produced.

The tank is of iron, with as many anodes hung on the side of the tank as possible. This is the positive pole. The cathode bar lies along the middle of the tank and is insulated from it. An insulated steam coil completes the equipment of the tank. It is desirable to have the tank covered with a hood and this connected to a suction fan to remove the fumes.

The anode surface (tank plus anodes) has approximately 56 square feet. The work surface runs approximately 17½ square feet. Five volts are being used and the current density runs about 25 amperes per square foot. A batch of work is cleaned and plated in the short space of two minutes; then rinsed, dried, colored and lacquered.

Normally, the work comes to the plating room with a heavy coating of oil and drawing soap upon it. There is no difficulty encountered from this source. Slightly rusted work and some with a sort of scale do not interfere with obtaining a good deposit. Badly rusted, heavily scaled work, or pieces with oil burned on, are pickled first; only occasionally has pickling been necessary. The work having a coating of carbon is the only condition which causes blistering.

The formula is as follows:

Caustic soda	8	ounces
Soda ash	6	"
Water glass	1	"
Copper cyanide	4	"
Water to make	1	gallon
Sodium cyanide	7½	ounces
Temperature	200°	Fahr.

The upkeep of this solution requires additions of copper and sodium cyanides and caustic soda from time to time. The cyanogen broken up by the high temperature is naturally large, and additions of sodium cyanide are required oftener; but the increased production more than offsets the cost of the cyanide. This new way produces more work than two 350-gallon solutions did previously.

The most important feature in copper-plating in this manner and one which should appeal very strongly to the foreman

in these times of unrest, is the fact that plating of this nature does not require a skilled operator to get out the work.

It has been found, from our experience, that if the solution contains approximately 3 ounces of metallic copper and 2½ ounces of free cyanide per gallon, the oils and dirt will be cut from the work almost instantly, leaving a good, smooth, adherent copper deposit.

COLORING ZINC BLACK

W. G. Stratton

Small articles made of zinc, such as eyelets, fasteners, buttons, etc., are required to be black in color. The japanning of zinc is difficult, and the application of a black lacquer is often too expensive. A chemical method was developed that gives a durable, deep black color, which can be further protected with a clear lacquer.

After cleaning, the zinc articles are put into an oblique iron tumbling barrel and covered with water. To this, from two to four ounces of sulphuric acid is added, and this is allowed to roll until a good, bright color is obtained. This generally takes about 15 minutes. The water is removed and the work thoroughly rinsed to remove all sulphuric acid.

The work is permitted to remain in the same barrel and again covered with clean water. Three pints of a stock solution of the "oxidize" given below is put into the barrel, and this is rotated for two minutes. The time of rolling can be determined by the change of color of the "oxidizing" solution, which will be from green to brown. The solution is poured off and thrown away, and the work is again covered with clean water. No rinsing is necessary, and the same amount of the stock solution is added and the previous operation is again performed. That operation is repeated from three to five times until a jet black color is obtained. After the final roll the work is thoroughly rinsed, washed with hot water and immediately dried in a tumbling barrel with hardwood sawdust.

It is the better method to gradually produce the color with weak solutions of the "oxidize" than to try to hasten the operation with stronger solutions. If too strong solutions are used a black smut will form on the zinc which has no adherence. If the operations are followed as described, a good, hard, black finish, which is quite durable, can be obtained.

Stock "Oxidizing" Solution

Copper sulphate	5	lbs.
Potassium chloride	3½	lbs.
Ammonium carbonate	4	ounces
Water to make	6	gallons

ELECTRIC CLEANING

By Arthur W. Theis

One of the most important operations performed in the plating room is the preparation of articles for the plating bath.

All platers know that articles must be chemically clean before attempting the electro-deposition of any metal, but perhaps some of us do not realize what a direct bearing our methods of preparing work for plating have on subsequent operations in other departments. For instance, in preparing articles of German silver for plating, it is customary to first remove any grease or oil in a hot alkaline solution, then rinse and dip through a bright dip composed of sulphuric acid, nitric acid and a little hydrochloric acid or sodium chloride, and finally rinse and either dip through a mercury dip and strike, or else omit the mercury dip and bring directly into strike. This method is very satisfactory when an expert operator is dipping the work, but when an inexperienced man is doing this work, articles are very apt to be exposed to the action of the bright dip for an excessively long period, with the result that the soft electro-positive constituents of the alloy are dissolved out, leaving the hard electro-negative crystals unacted upon, and the result is a rough surface which shows up when burnished or buffed and which requires an excessive amount of labor to bring to a good color.

About a year ago I decided to eliminate the bright dip, and, after some experimenting, did so, substituting an electric cleaner in its place. An iron tank of convenient size is used as the positive electrode, and the articles to be cleaned as the cathode. Current density, about 50 amperes per square foot. The tank is fitted with a closed steam coil for rapid heating, and solution kept just below the boiling point. I have tried out many of the cleaners on the market, but at present use a solution of 36 per cent causticized ash, about one-half pound per gallon. This is very economical and very efficient.

There is a difference of opinion as to whether work should be made anode or cathode. From one standpoint it would seem reasonable to suppose that it would be wiser to use as anode, figuring that the cleaning process is a removal of electrode material: but when you consider that it is very essential to remove all oxides from metal before plating, it seems wiser to use as cathode, for the reason that gas formed at anode is oxygen, while that formed at cathode is hydrogen. This is found to be the case in practice.

Some advantages of the electric cleaner over the bright dip, when used on German silver, are:

1. The polished surface of work is not removed, or attacked, so that much less labor is required in the subsequent operations of burnishing or buffing.

2. The work can be more satisfactorily handled by inexperienced help.

3. The cost is less.

4. The operator has less ruined clothing.

5. The acid fumes are conspicuous by their absence.

6. The plating room is a healthier place to work in.

7. The percentage of work showing a non-adherent deposit is no greater.

Foreman, Plater Factory "H," Int. Silver Co., Meriden, Conn.

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NEW PROCESS SPEEDS ELECTRO-PLATING

Special to Business Section Philadelphia Public Ledger:

London, Dec. 7.—Great interest attaches to the discovery by Frank Mason, a lecturer at the University of Sheffield, and a practical works manager, of a new process in electro-plating, which experts claim will increase output by 100 per cent.

The point of Mr. Mason's discovery lies in the rapidity at which quick plating can be done without the risk of "burning." According to the present practice in the trade, the rapidity at which the deposition of the silver on any article being electro-plated is made depends on the strength and quantity of the electricity put into the chemical plating bath. If the electric current is increased beyond a given standard, the "plate" is burnt, although the plating is more rapid. In the new process, by varying the chemical composition of the plating bath or electrolyte, it is possible not only to more than double the current of electricity, and thereby make it work twice as quickly as by the present practice, but to get a "plate" of the best.

Question.—When cutting down fine gold to gold chloride, what is the white sediment which appears?

Answer.—Answer was given as silver chloride.

Question.—A nickel solution made up of 8 ounces double salts to the gallon and the requisite conducting salts and replenished with single salts. The work being plated was bibbs. Plating had been coming through O K, when of a sudden, for about ten days they peeled on the spouts only, the bodies being O K, tested by being burnished. These failed bibbs were then stripped and repolished and plated and came out perfect.

Answer.—Opinion was given as being due to the cleaning operations.—Toronto Branch.

CORRECTION

An error was made in the answer to Question 8 under "SUCCESSFUL METHODS" in December Review. It should read to use direct current instead of reverse current in sulphuric acid.

MYSTERIES OF THE BRIGHT SILVER BATH

Amos G. Reeve

Some of the platers "from Missouri," perhaps, and maybe others, have indulged at times in a little quiet smile and derisive remarks possibly, regarding fellow-brothers of the craft, who have found themselves hard pressed for an explanation as to the whys and wherefores of unfavorable silver deposits, and who have, in their dilemma, resorted to the changes in weather and atmospheric conditions for an excuse or tangible explanation.

This, however, is rarely accepted by the management of a factory with good grace, for if it is believed, as a fact, it is only with great reluctance and displeasure, because any successful manufacturer does not like to be told that certain forms of undesirable plating are uncontrollable and liable to occur intermittently.

Nevertheless, it has been noticed with interest and curiosity that in a surprising number of instances certain erratic and unfavorable performances of the bright silver baths would coincide with changes in temperature and atmospheric conditions. Offhand, it seems somewhat mysterious as to how or why this could happen, and I hope we will have a general discussion of the phenomenon a little later.

In order to discuss this problem carefully and systematically, let us assume that a plater who has experienced this difficulty has used the carbon bisulphide for brightening purposes for a long time and is familiar with it—that he dissolves the carbon bisulphide in a suitable quantity of silver-plating or other cyanide solutions and always has on hand a quantity of this, which he has carefully prepared and is of uniform strength in the bisulphide ingredient—let us call this the "Standard Brightener Solution."

Now, inasmuch as we have already assumed that the plater has operated these baths as "bright baths" for a long time—his success can likely be attributed in great measure to the care and regularity with which he has dosed the baths with the standard brightener solution or "addition agent," as the chemists call it. In all probability he doesn't give a 200-gallon bath a one-half ounce dose today and 5 ounces tomorrow and 2 ounces the next day, but he has undoubtedly found by careful observation just how much of the brightener needs to be added to each bath every day, or perhaps every second day.

Perhaps there are some who have operated a number of silver baths and have done all these things with care and regularity, and have had most excellent results all winter, and begun to feel that after all, if a fellow was regular in his practice and took some interest in his work, the manipulation of bright solutions was not particularly difficult. Now, maybe some of the fellow-craftsmen noticed with pride and satisfaction that the bright deposits were becoming even brighter, and better than usual, although no change had been made in the dosing schedule,

and a few days later that the extreme brightness began to wane, and after two or three more days the brightness disappeared almost entirely, or appeared only in streaks or spots here and there. All this taking place without any apparent cause or good reason.

The mysteries which often surround the bright silver bath and its deposits and its obstinate refusal to respond as desired to the usual dosing treatment, constitute, perhaps, the chief objection to its more general and extensive use.

Change in the temperature of the bath is one of the things over which the plater has least convenient control, and looks inviting as a solution of this intricate problem.

In producing the bright silver deposit there are three main governing factors:

1. Temperature of bath.
2. Current density, or amperes per unit of cathode surface.
3. Percentage of carbon bisulphide per gallon of plating bath.

Probably these are of equal importance, and it seems as though the secret of success lies in maintaining all three in the correct relation to each other.

Returning again to the example of the unusually bright deposit that waned and became dull simultaneously with the rise in temperature of the late spring weather:

The carbon bisulphide being a volatile substance, the natural inference has sometimes arisen that with higher temperatures and increased circulation of the atmosphere by open windows, etc., more rapid evaporation of the bisulphide would take place, and hence the dullness was attributed to an insufficient volume of carbon brightener, and the dosing was accordingly increased not only once, but perhaps several times, with the final result that the deposits would be quite dull—showing very little sign of brightness.

In such cases, the bright deposit would return only very gradually, after a considerable period, during which the bath received no brightening additions whatever.

Presumably the most of us have found that the brightest and best results are obtained in bright baths when maximum current densities are used; also, that as the temperature rises in any bath, greater current densities can advantageously be employed.

Assuming for the moment that we are all human and are subject to a certain degree of carelessness, have we not, perhaps, adhered to our established current density schedules, ignoring the rise in temperature, thus using after the bath has become warmer, current densities considerably less than maximum and proportionately unfavorable for bright work?

If this is correct, it would appear then that:

As the temperature increases, the current density should also increase, and, likewise, the carbon bisulphide should be increased proportionately.

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But, inasmuch as the volume of carbon bisulphide is extremely small, the actual increase in volume of this would be very small indeed, if kept in proportion with the acceleration of electro-chemical activity as brought about by the increase of the other two factors.

Another feature that will bear some observation and study is the apparent difference between cold baths of say 60° temperature and baths of 80°, as to permissable variations in the three factors already mentioned.

The colder baths seem to be much easier to manage, presumably because of a wider range in the permissible volumes of the second and third factors. On the other hand, although the warmer baths deposit more speedily, the range of permissible volumes and variation in proportions of the second and third factors narrow down quite rapidly, and the production of deposits of superior quality becomes a much more difficult problem.

If some simple method could be devised whereby we could easily and quickly determine fairly accurately the volume of carbon bisulphide present in the silver bath, it would go a long way toward a permanent solution of this old problem.

February issue of the "Monthly Review" will be Providence-Attleboro Number. We have already received several good papers.

WHAT ELECTRO-PLATERS IN ENGLAND ARE DOING

G. A. Hogaboom

That electro-platers in England have recognized the value of discussion of the technical side of their work, is well illustrated by the character of the papers presented at a joint meeting of the Faraday Society and the Sheffield Section of the Institute of Metals, on November 19, 1920, at which time there was a general discussion and symposium on "Electro-plating."

The following papers were presented:

*"Electro-plating for the Prevention of Corrosion."—By Weslie Aitchison, D. Met., B. Sc.

*"The Use of Colloids in Electro-deposition of Metals."—By W. E. Hughes, B. A.

*"The Electro-deposition of Cobalt."—By Byron Carr.

*"Electro Silver Plating and Its Technical Development."—By W. R. Barclay, A. M. I. E. E.

*"The Chemical Composition of Old Silver-plating Solutions, with Observations on their Working Properties."—By G. B. Brook, F. I. C., and W. L. Holmes.

*"A New Maximum Current Density in Commercial Silver-plating."—By Frank Mason, A. M. I. E. E.

*"The Crystalline Structure of Electro-deposited Silver."—By G. B. Brook, F. I. C.

Contributions to the discussion are invited from members unable to attend the meeting.

A limited number of advance proofs of the above papers may be available before the meeting . . . "

The last sentence should be of considerable interest to the members of the American Electro-Platers' Society. If there were advance proofs of the papers that are to be presented at the next convention, better discussion could be had. Even if the mind is centered on what is being read, it is not possible to grasp the points that should be discussed, and many points that would have been brought out are lost. The advance papers should be ready so that they could be read before every branch society at the meeting just previous to the convention. If the discussion was presented in writing at the convention, it would be the means of placing the views of a large number of members in a clear manner and eliminate the errors which are bound to occur in stenographic reports, unless they are edited.

There should be at least 15 papers presented at the next convention. The writer will be one of that number to offer a paper to the Committee on Papers for the next convention, if it conforms with their plans, not later than April 15, 1921.

What are you going to do? Surely you are not going to allow the platers on the other side think that the progressive American Electro-Platers' Society members cannot match them in presenting papers. On the Job. You have received much from previous conventions, now, Give Something. ON THE JOB.

*These papers and some of the discussion appear in either November 26th or December 3rd issue of the English edition of the "Metal Industry."

THE USE OF CADMIUM IN THE PLATING INDUSTRY

H. T. Cain

Cadmium is a white metal of a silvery appearance, yet with a distinct tinnish cast. It is usually found associated with zinc, either as a carbonate or a sulphide. There is a true cadmium ore in which it exists as a sulphide—Greenockite—but that is an extremely rare mineral. It is also found as an oxide with calamine in the zinc deposits of Monte Poni, Sardinia. The entire commercial supply is obtained by the smelting of these ores. Upon distillation with zinc, cadmium, being more volatile, goes over first, which is the general method of separation.

The melting point of cadmium is 300°C., the boiling point

770°C.; in weight it approximates copper, having a specific gravity of 8.6, as against 8.9. The atomic weight is 112.4, and it is a bivalent metal. It is malleable and ductile, and in alloying with tin, bismuth and lead produces an alloy that has a very low melting point. "Woods'" alloy, consisting of approximately lead 25%, bismuth 50%, tin 12.5% and cadmium 12.5% has a melting point of about 140°F.

Cadmium displaces hydrogen from weak acid solutions, and consequently is soluble in all acids. Nitric acid is generally used as a solvent, but it is slowly soluble in hydrochloric or sulphuric acid. Sodium or potassium hydrate precipitate cadmium as a hydrate from acid solution, which is not soluble in an excess of the reagent. The cadmium hydrate precipitated by aqua ammonia is very soluble in the precipitant, a complex salt being formed with zinc, copper or nickel, if present. The alkali carbonate precipitate cadmium from the acid solutions, which is insoluble in the excess of the reagent.

Sodium or potassium cyanide form a double salt of cadmium, K_2CdCN_4, which is analagous to zinc cyanide. This salt is not so strongly bound as the double cyanide of sodium or potassium of copper, but is readily broken down by hydrogen sulphide, cadmium sulphide being formed. The double cyanide of copper does not act in such a manner, and this forms the basis for one of the methods of separating copper from cadmium.

The double cyanide of cadmium is the salt upon which the interest of the electro-plater is focused. The deposits obtained from solutions of the single salts of this metal are generally very crystalline. A pure cadmium deposit can claim no special merit. Its color at best cannot approach that of silver. When scratched-brushed or buffed the bluish grey color is not particularly attractive. It is cheaper than silver, but more expensive than zinc or tin, consequently its use is limited in the electroplating industry.

When electro-plated as an alloy with silver the resulting deposit is improved in color. Patents were taken out as early as 1892 by Cowper Coles, English Patent No. 1391, who claimed a color equal to silver at a greatly reduced cost. This color was best when the deposit had 25% cadmium and 75% silver. The Arcas Silver Co., which was formed at that time, subsequently failed. It has been found difficult to maintain the necessary proportions so as to obtain an economical deposit, as the silver has a strong tendency to deposit in preference to the cadmium. The composition of the deposit can be determined only by analysis, and cannot be approximated by color as can be done with a brass deposit. There is no reliable means of controlling the deposit, and the electro-plater would have a difficult job to definitely determine the cost of such a deposit. That condition has prevented the general use of this method in the electro-plating industry.

A LACQUER ROOM PROBLEM

John Silver

A short time ago the writer was asked to investigate an epidemic of spotting-out on lacquered brass goods, and the ways and means employed to obtain the desired results, have prompted him to place them before those of you who may have similar difficulties:

A. The Problem

Brown spots were appearing upon sheet metal shells after lacquering. They varied from a mere speck up to one-eighth of an inch in diameter in size, and each apparently had a center. The spotting was neither uniform nor universal, as one piece would be very bad, while another close by might only have one or two, and then again the next four or five would be free from them.

B. The Former Procedure

1. Prior to Lacquering

After buffing, the pieces were put on racks, twelve to each rack, soaked in fish-oil soap, rinsed in hot water, dipped in cyanide, rinsed in cold water, then hot water, and dried in sawdust. They were removed from the racks, placed upon heavy cardboards, each holding twelve. The loaded cardboards were piled one upon the other in stacks of 48, and put into trucks, each truck holding two piles, and sent to be lacquered.

2. Lacquering Operation

The loaded boards were removed from the truck at the machine. The shells were spun while being sprayed. As each was lacquered they were replaced in their wet condition upon the same boards as before, and left to air-dry in another part of the room. Usually an hour elapsed before they were taken from the boards, inspected and packed. "And then the fun began."

C. The Investigation

1. Thinking that perhaps the spotting was caused by porous metal, pieces were examined under a glass. Each spot had a tiny black speck in the center, but there were no imperfections in the metal.

2. The fish-oil soap and cyanide solutions were found to be as usual.

3. A sample of the sawdust used for drying was tested for the presence of resins by extracting with lacquer thinner. The extract evaporated upon a clean, highly polished surface and did not leave a stain.

4. Because the separators on the air-lines are being kept in good condition at all times, and because other varieties of sprayed work have never been spotted, it was considered unlikely that the trouble could come from this source.

5. The foreman blamed the lacquer. In endeavoring to keep up production, he tried out all available brands of lacquers and their respective thinners. Only one proved to be effective, and, strange to say, happened to be the cheapest lacquer used for dipping. The high priced cotton lacquers caused more spotting than the mixture commonly used. This information gave us the idea that possibly the higher priced solvents were coming in contact with something which was being dissolved by them, and this something being left behind after the solvents had evaporated, was of such a nature as to readily tarnish the brass.

6. Therefore pieces of cardboard were examined. Decomposing a sample with fuming nitric acid, and after boiling off an addition of bromine water, barium chloride was added, and a heavy precipitate of barium sulphate appeared. This proved that the cardboards were heavily contaminated with sulphite compounds.

7. Pieces of the cardboard were then digested with the thinner regularly used. The resulting liquid, without lacquer mixed with it, when sprayed over a cleaned shell tarnished the entire surface. This tarnish was of the same coloring as the spots. Experiments with other thinners showed that those containing acetates were the ones which caused the spotting. And so it was found that when a cardboard tray was laid on top of a tray of freshly lacquered shells, bits of the cardboards fell upon the surfaces, the sulphur compounds were leached out by the solvents and the same tarnish was obtained as when a piece of brass is first dipped into a liver of sulphur solution and then into a weak acid solution.

D. The Answer

1. The mode of handling after drying the shells was then changed. The cardboards were discarded entirely and wooden boards substituted. The lacquer room was given a thorough cleaning, using a vacuum cleaner.

Since these changes were effected the spotting has entirely disappeared.

E. The Moral

1. Protect the work from all possible contamination and keep the lacquer room and its appointments as clean and neat as an old-fashioned parlor.

It is not too early to make your plans to attend the Indianapolis convention. We can depend that the boys of the "Hoosier" state will make it worth while.

SUCCESSFUL METHODS

Question No. 1.—In electro-galvanizing in acid solutions there is no deposit in deep recesses. Experiments show that they take the current. Is it due to the acid redissolving the deposit?

Answer.—It is believed that when solution is too acid the sulphuric acid does redissolve the deposit, causing the recesses to be dark and have no deposit. It was suggested that to overcome this, some castings should be sand-blasted and then strike in a chloride of tin solution and then plate in acid zinc bath to overcome the fault.

Question No. 2.—Can brass be plated ⅛ inch thick, and is there an acid brass solution?

Answer.—Brass can be deposited ⅛ inch thick by plating for a given time, then removing and scrubbing or scratch brushing and replacing into the bath and repeating the operation until the proper thickness is obtained. We know of no acid brass solution at present time.

Question No. 3.—Is nickel as deposited from the anodes we use impervious to rust?

Answer.—When deposited upon brass it is not discernable, but when deposited upon steel it will show rust when exposed to the elements.

Question No. 4.—Is it necessary to have steam coil in electric cleaner tank insulated if the generator is connected direct with the cleaner tank only and not connected in any other tank?

Answer.—It is felt that, inasmuch as the 'phone companies or electricians sometime ground their wires on steam pipes, that it is not only necessary, but the only safe way to do.

Question No. 5—What will oxidize German silver by immersion?

Answer.—Sand blast article, then make up solution of nickel salts and hyposulphite of soda saturated, then add small portion of sulphuric acid and immerse article; use hot.

Question No. 6.—What is a good pickle for German silver that has been annealed?

Answer.—Sulphuric pickle, about 6 parts water to 1 part of acid.

Question No. 7.—What is most practical method of recovering silver from old plating solutions and cyanide striking solutions?

Answer.—Add hydrochloric acid and then add sulphuric acid and zinc, then fuse and get metallic silver; however, this is not advisable unless volume of solutions are very large, as cost of operation of recovery is very high.—Chicago Branch.

WHAT THE BRANCHES ARE DOING

Bridgeport.

Meets third Friday of each month in its laboratory, 260 John St., Bridgeport, Conn. Secretary, Louis J. Maraffi, 744 Hancock Ave., Bridgeport, Conn.

Our December meeting was held Thursday, the 22nd, with 11 members present, Vice-President John W. Slattery presiding. The application of James H. Morsehead was read and he was elected as an active member. It was voted to make our January meeting an open one and also a smoker. Members were asked to invite their plater friends. Mr. Bissell, of the Bissell Varnish Co., will give a talk on varnishes and japans, and he will also exhibit samples of wood finishes, etc. Members were asked to bring in some small articles or samples of their work so that they can be nickel plated in the laboratory in trying out some nickel solution.

The second quarter P. C. tax and all bills were ordered paid. Christmas greetings were extended to all the members by President J. M. Dunn through Mr. J. W. Slattery.

Boston.

Meets first and third Fridays of each month, 8 p. m., at the Quincy House. Secretary, A. W. Garrett, 37 Dorset St., Dorchester, Mass.

Boston Branch met December 17 with President Mackie presiding. After the reading of minutes of the previous meeting, communications and bills, we had a report from our Banquet Committee. This committee is working hard to make it a success and Boston Branch should have one of the best banquets ever held by the A. E. S.

The members held a little discussion on the subject heard at the Providence banquet, that of electro-typing. This was very interesting and will be the discussion at our next meeting.

Boston Branch met January 7 with President Francis Mackie in the chair. After the regular order of business, the permanent charter was received. The election of officers will take place the first meeting in March.

Mr. Edward J. White, of 33 Cornwall street, Jamaica Plain, Mass., was elected to membership.

A report of the Banquet Committee was very favorable and a grand success is looked for.

Chicago

Meets second Saturday of each month, 8 p. m., at the Briggs House, Randolph and Wells Sts., Secretary, Frank J. Hanlon, 2855 N. Richmond St., Chicago, Ill.

At our regular meeting held on January 8th we had a good attendance. Two applicants were elected to membership and two applications were received and referred to the Board of Managers.

The Banquet Committee said that everything was all set for the big doings on January 29th and that tickets would be sent out in a few days.

Several present made use of the Question Box. These brought up much discussion. (See Successful Methods.)

Mr. E. S. Thompson gave a descriptive discourse on "Ionization and Electron Theory," using a blackboard. This was not completed owing to lateness, so was continued to our next meeting.

Cincinnati.

Meets on the first and third Friday of each month at Dennison Hotel. Secretary, W. J. Husing, 729 McMakin Ave., Cincinnati, O.

Our regular meetings twice each month are being well attended. On January 7th one applicant was elected to membership.

We are planning to keep in line by holding a social affair of some kind soon.

Cleveland.

The Cleveland Branch meets every second and last Saturday of the month at 1344 East Prospect St. Secretary B. F. McCormick, 1941 West 77th St.

At our regular meeting held on December 11th, a paper was presented by J. C. Singler on "Cleaners." While this subject is discussed frequently, it is of great importance to those anxious to know their makeup.

Mr. J. Purcell also read a paper and made a demonstration on "Analyzing Nickel Anodes." This was so interesting that it commanded strict attention on the part of our members. We don't know where Jim gets it from, but it was clever.

We had a large attendance and interesting meeting on January 8th. President Scott explained the methods employed in the plating of automobile headlight reflectors, beginning with

the copper cleaner, then to the cyanide copper, acid copper, nickel and finally the silver bath.

Many questions were asked and a general discussion followed.

One new member was elected.

The secretary was instructed to write to the editor of the "Monthly Review" and if possible to reserve the June issue for our branch, as we believe we can produce sufficient material for a "Cleveland Number."

Detroit.

Meets first Friday in each month at Cass Technical High School, Platers' Classroom, 2nd Avenue and Beech Street, at 8 p. m. Secretary, E. G. Lovering, 3719 Grand River Avenue, Detroit, Mich.

Regular meeting of Detroit Branch held January 7th, President Kutzen presiding, with good attendance. After disposing of the regular business, Mr. Phillips, of the Inland Motor Products Co., surprised us with the gigantic strides they are accomplishing in the electro-deposition of copper. They are about to install an equipment for plating large steel tank cars. These steel tanks have a capacity of 8,000 gallons and a deposit of copper 1-16 inch thick is to be deposited on the inside of these steel tanks; a 7,000-ampere machine is to be used. To the average plater this seems like a gigantic undertaking, but Mr. Phillips only smiles and then goes on and relates the feasibility of depositing copper on the bottom of sea-going vessels while they are in dry dock. Oh, boy, who said the platers are not becoming electro-plating engineers?

Mr. Woodmansee exhibited samples of nickel-plating done in a hot electrolyte in a mechanical plating equipment. General discussion followed.

The platers' class at the Cass School is progressing very nicely, thanks to the untiring efforts of Prof. Phillips. Much discussion on the theory advanced by Mr. Hopkins, of Bridgeport Branch, regarding magnetized parts attracting iron particles in the bath.

Grand Rapids.

Meets on the second Wednesday of the month at The Morton House. Secretary, J. B. Hawley, 1317 Jefferson Ave., Grand Rapids, Mich.

Our regular meeting was held on the 12th inst., with a very good attendance. We were pleased to note the presence of a visitor from one of the most important branches, Mr. Gillard, of St. Louis Branch.

The meeting was mostly in the nature of a "pep" conference. Discussion was warm on the question of an annual banquet to be held in March. The Banquet Committee, appointed by President Allen, consists of Mr. Poe, chairman, Mr. Whalley, Mr. Hawley and with Mr. Werft to do most of the work.

After a lively discussion a permanent committee on membership was appointed with Mr. Rickson as chairman.

Our visitor assisted in the discussion when asked by the chair the reason for St. Louis Branch's prominence in the society, and also why their banquet is one of the most successful in the society.

After the business session Librarian Whalley exhibited samples of gold-plating brought by Mr. Hawley and a short discussion was held.

The meeting was also addressed by Professor Simpson, of the University of Michigan, with regard to one of the University's extension courses in foremanship.

Indianapolis.

Indianapolis Branch holds its business meeting the second Saturday in each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

Indianapolis Branch held its regular meeting January 8th, with President Hennessey presiding. The attendance was fair.

After some discussion of convention plans, it was decided to hold a special meeting at our next regular meeting night to get together and start on convention work. One application for membership was received.

Mr. R. McCracken, of The Leedy Manufacturing Co., gave his experience in mechanical polishing and plating, showing samples having gone through the different operations of sand tumbling, ball burnishing and finished bright in nickel. As there is not much of this class of work being done in the city it was quite interesting.

Newark.

Meets first, third and fifth Fridays of each month, 8 p. m., Foresters' Home, 20 Central Ave., Newark, N. J. Secretary, O. F. Carlson, 225 West Grand St., Rahway, N. J.

At the regular meeting of the Newark Branch, A. E. S., held on December 3rd, the attendance was very large, and keen interest in the proceedings was shown, especially in discussing the report of the committee appointed to negotiate with the Board of Managers of the Newark Technical School for the pur-

pose of securing the use of the plating room and laboratory of the school. It was suggested that a class in chemistry and research be formed, and the members of the class be required to pay a small fee, sufficient to make up for the added expense. Seventeen of those present signified their desire to join the class.

The report of the committee was accepted as one of progress, and the committee continued and instructed to try and secure better terms from the manager of the Newark Technical School.

The subject for the evening, "Cleaners," proved to be one of the liveliest we have had in some time. It was started by the reading of a paper on the subject by Mr. Theo. Kreuder. Everyone present had something to say in defense of his favorite cleaner.

The meeting of December 17th was also very well attended, and the subject was "Coloring Gold," a paper by Mr H. W. Young, describing the methods of getting four different finishes from the same solution.

Fluo-Borate nickel solutions was also discussed.

President Sievering gave a very interesting talk on a trip through New England which he had recently taken, and the different large factories in that district he had visited, describing their different methods of handling work in their plating departments.

The subject for next meeting will be a paper on hot nickel solutions, by Mr. Royal F. Clark.

New York.

Meets every second and fourth Fridays of each month at the Broadway Central Hotel Parlors, New York, N. Y. Secretary, John Burke, 110 Glen St., Brooklyn, N. Y.

President Sterling presided at the December meetings of the New York Branch of the A. E. S. Mr. Charles Gierdano was elected active member of New York Branch.

A letter of encouragement was sent to Mr. C. H. Buchanan, a very active and valuable member of the New York Branch, whose health was reported critical.

It has been decided the dues for membership in New York Branch be advanced to $10.00 per year beginning June, 1921. New applicants will be obliged to comply with the above decision from date of application.

The following subjects were lengthily discussed at the December meetings: Dip lacquering small brass articles, the composition of a grass green gold anode.

Philadelphia

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, Philip Uhl, 2432 North 29th St., Philadelphia.

The regular meeting of our branch was held December 3rd with the president, D. A. Metz, presiding. After the regular routine, Mr. E. T. Homan gave an interesting talk on the cleaning of brush brass work by the electro-cleaner, which covered the subject very thoroughly.

At the January meeting, Mr. Gorling told how he removes the scale and nickel plate umbrella bibbs.

Mr. Chas. Bayer will speak on zinc-plating February meeting. Two applicants were elected to membership.

Pittsburgh.

Meets every first Saturday at 8 p. m. at United States Bureau of Mines Building, Forbes St. Secretary S. E. Hedden, 227 5th St., Aspinwall, Pa.

Meeting of January 7th called to order by President John Corbit. The regular business being taken care of, application of Mr. George Newman, Pittsburgh, Pa., was received and turned over to the Board of Managers for investigation. Mr. Isaac H. Levin duly reinstated to associate membership. As the committee that had charge of the 1920 banquet carried it to a successful end it was decided that the same committee, with the addition of Mr. N. Zadoski, who has had considerable experience in the banquet line, be added to the committee. Banquet to be held on Saturday evening, April 16, 1921.

Our next meeting will be open and in charge of Mr. Edwin S. Gray and the secretary. Mr. Gray will entertain the members and their friends with lantern slides, and those that attend will have an enjoyable evening.

The following questions were asked and anyone that has the desired information will be thanked for their answers in the Review:

A successful method of plating die castings on racks.

A material for stamping sheet steel, other than oil.

The proper method of wiring tanks; where is the proper place to install rheostat, positive or negative line?

Advice of those that have had experience with lead anode hooks.

It was decided to have a lecture on dynamo construction and wiring at our March meeting.

St. Louis.

Meets first Saturday of each month at Barr Branch Library, corner Jefferson and Lafayette. Secretary, H. H. Williams, 4156 *Botanical Ave., St. Louis, Mo.*

Regular meeting was held on January 15th with 17 members present. The most important business of the evening was taking care of details for our annual banquet. The chairman, E. J. Musick, has a real system in handling these affairs.

Under the librarian the subject of "Zinc-Plating" was taken up and papers were presented by F. N. Weber, T. F. Carson and F. Horath. The first two were on "Acid Zinc" solutions and the latter on "Alkali Zinc" solution. The papers were a credit to the writers, each of whom do large quantities of zinc-plating.

The subject for the February meeting will be "Nickel," with papers by G. Lamkemeyer, W. J. Flannery and G. J. Brandt.

Beginning with February our regular meetings will be held on the first Saturday of each month.

Reading.

Secretary, Chas. H. Bingaman, 127 *Greenwich St., Reading, Pa.*

Rochester.

Meets on the fourth Fridays. Secretary, Sylvester Gartland, 128 *Bryan Street, Rochester, N. Y.*

Milwaukee.

Meets first Friday of each month at West Side Bank Building. Secretary, A. W. Ruttan, 1105 *Twenty-eighth St., Milwaukee, Wis.*

Toledo.

Toledo Branch meets 1*st Thursday night each month at Toledo University Science Building, Electro-Platers' Room, corner Cherry and Page Sts. H. L. Myers,* 410 *Palmer St., Secretary.*

Providence-Attleboro.

Meets first and third Thursdays of each month at 26 *Custom House Street, Room* 16. *Secretary, Clayton J. Poyton,* 269 *Ohio Avenue, Providence, R. I.*

Toronto.

Meets second Thursday of each month at Occident Hall, Bathhurst and Queen Streets. Secretary, Chas. Kemish, 271 *Boston Avenue, Toronto, Ont.*

Dayton.

Meets first Saturday of each month at the Y. M. C. A, Dayton, Ohio. Secretary, Alphonz Lamoureux,* 432 *E. Second St.

ELECTED TO MEMBERSHIP

Boston.

Franklin W. Hobbs.....27 Lane St., Bangor, Me.
Philip Nelson.....80 Devon St., Roxbury, Mass.
Edward J. White.....33 Cornwall St., Jamaica Plain, Mass.

Bridgeport.

J. H. Morsehead.....89 Ridgewood Ave., Waterbury, Conn.

Chicago.

John B. Kingsworth.....401 4th Ave., Rock Island, Ill.
Joseph Triska.....2701 Ogden Ave., Chicago, Ill.
E. A. Wells.....814 Wasseu Ave., Waukegan, Ill.

Detroit.

Wilber Preston.....1100 Stewart St., Owasso, Mich.

Milwaukee.

E. A. Wolf.....868 21st St., Milwaukee, Wis.

New York.

Chas. Giordano.....271 W. 126th St., New York, N. Y.

Philadelphia.

Robt. E. Harrison.....221 Arch St., Philadelphia, Pa.
Joseph T. Berenato.....2213 Pierce St., Philadelphia, Pa.

Toronto.

W. J. Lamb.....10 Larch St., Toronto, Ont., Can.
W. J. Whaley.....335 McDonnell St., Peterboro, Ont., Can.
Geo. Lacheur.....174 Perry St., Peterboro, Ont., Can.

APPLICATIONS FOR MEMBERSHIP

Chicago.

Samuel J. C. Trapp.....147 S. 13th Ave., Maywood, Ill.
Harry G. Lama.....Marshalltown, Ia.

Pittsburgh.

Geo. Newman.....Pittsburgh, Pa.

Indianapolis.

Albert Boyd.....1043 S. Locke St., Indianapolis, Ind.

Transferred from Toronto to Montreal.

G. M. Burns, A. W. Picton, Elmer Avery, J. A. Bloxal.

All manufacturers, together with their managers, superintendents, chemists and platers, whether members or not, are cordially invited to attend, and do not forget to bring their ladies with them, the

The Twelfth Annual Banquet

of

NEW YORK BRANCH

American Electro Platers Society

TO BE HELD AT

ALDINE CLUB

200 Fifth Ave., cor. 23rd Street

NEW XORK, Y. Y.

SATURDAY **February 10, 1821, 7:30 P. M.**

An especially attractive program has been prepared for this occasion. Interesting speakers will deliver addresses. Beginning at 3 o'clock there will be an afternoon session in the parlors, at which papers of interest will be read and discussed, including the following:

Zinc Solutions.

Cyanide vs. Acid.

Importance of Anodes in Plating Operations.

Current Densities and Voltages, etc.

Manufacturers and dealers in plating equipment and supplies should reserve space in the booklet which will be distributed on this occasion, space being $10.00 per page

Tickets and information regarding the booklet can be obtained from the Branch Secretary, Mr. John Burke, 110 Glen street, Brooklyn, N. Y., or any of the members.

If you are in New York do not miss this opportunity.

THOMAS B. HADDOW, Chairman.